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Remarks

Claims 51-64, 71-84, 91-94 and 99 remain in the application. Claims 1-50 and 95-98, standing withdrawn as being drawn to a non-elected invention and have been cancelled, but this does not indicate that Applicants have abandoned the invention or the intention to pursue patent protection for the non-elected invention.

Claims 51 has been amended to more particularly point out the invention by narrowing the basis wt. range of the mat, by reducing the length range of the glass fibers, by reducing the range of polymer fibers and by reducing the range of binder in the mat. Basis for these amendments can be found in Examples 1-3, in the previously presented dependent claims and in the specification in the paragraph spanning pages 3-4. Claim 91 has been amended to narrow the basis wt. range of the mat, basis found in the second paragraph of page 8 of the specification. Claims 51 and 91 have also been amended to limit the type of binder in the mat by using the term "consisting essentially of", basis being found in previously presented claim 99. Claim 99 has been amended to read on the mats within the bounds established by Examples 1-3 in the specification. Claims 59-64 have been amended to add limitations found in previously presented claims. Claims 71-76 have been amended to delete a redundant limitation.

The present claimed invention are mats comprised of a blend of at least about 84 wt. percent and up to about 92 wt. percent of glass fibers having diameters in the range of about 13 to about 17.5 microns and lengths in the range of about 0.7 to about 1.25 inches, and about 8 to about 16 wt. percent of polymer fibers, often polyester fibers, the blend of fibers bound together with about 25 +/- 5 wt. percent and of a particular type of binder. The claimed mats have excellent flame resistance and excellent and unexpected tensile strength, flex and recovery properties after scoring and folding, the mat passing the National Fire Protection Association's (NFPA) Method #701 Flammability Test as well as critical tensile strength and a Tabor Stiffness of at least about 50, properties essential for the mat to be used ceiling tile of the type described in U.S. Published Patent Application No. 20020020142. As pointed out in the Summary section of the specification, these properties are unique and unexpected in nonwoven mats containing a majority of glass fibers bound together with an organic binder. Also, as pointed out in the Jaffee Declaration, Jaffee being an expert in nonwoven mat technology and being aware of the contents of the references cited by the Examiner, made more than 100

different mats containing many different combinations of different fibers and different binders before a mat composition was tried that produced a mat that met the properties required for a mat to be used in the ceiling tile described above. Once that breakthrough was achieved, then ranges of variations, including those of the Examples set forth in the specification, were found that also met the requirements of the ceiling tile, and some combinations of variables produced mats having the better properties for this use than others although many could be used.

An example of a ceiling tile of the type described in U.S. Published Patent Application No. 20020020142, this ceiling tile sample having nonwoven mat dividers spanning a facer mat and a backing mat, the mat dividers being scored and functioning to fold to allow the ceiling tile to be compressed to save space for packaging and shipping. The presently claimed mats are suitable for the scored and folding dividers in this type of ceiling tile. Also presented is a Declaration by the inventor, one having more than ordinary skill in the nonwoven mat art. The Declaration provides discussion of the magnitude of difficulty of developing the presently claimed mats, why the claim limitations are critical to some or all of the properties claimed, the differences with the Geel et al and Chenoweth et al references and his conclusions about the pertinence of the references cited and the Examiner's conclusions and arguments.

Claims 51-64 and 71-84 stand rejected under 35 USC 112, second paragraph, as being indefinite because the ranges of glass fibers and polymer fibers did not add up to 100 percent. In amended claim 51, the percentages of glass fibers and polymer fibers in the blend now add up to 100 percent. Applicants believe that these claims comply with 35 USC 112 and respectfully request the Examiner to withdraw this rejection and to allow these claims.

Claims 51-64, 71-84, 91-94 and 99 stand rejected under 35 USC 103 as being unpatentable over Geel in view of Arkens and as further evidenced by Chenoweth. The Examiner stated that Geel teaches nonwoven mats containing 10-80 wt. percent glass fibers and 20-90 percent PET fibers bound together with a resin binder, but not the type of binder used in the invention. The Examiner also stated that Arkens et al teaches a fiber glass nonwoven mat containing a type of binder of the type used in the invention and urges that it would have been obvious to have used the Arkens et al binder in the mats taught by Geel instead of the binder taught by Geel because both patents teach

making nonwoven mats of fibers bound with a resin binder. The Examiner also admitted that none of the references teaches the Tabor stiffness, ratios of wet to dry tensile strength recited in the claimed invention or that the mats pass the NFPA Method #701 Flammability Test, but presumes, without any evidence whatever, and contrary to the evidence presented in the Jaffee Declaration, that this property would be inherent in the mats of Geel and Arkens et al. This rejection and its basis is respectfully traversed.

Geel discloses a nonwoven mat for use in vinyl flooring, a completely different application having completely different requirements than application the presently claimed mat is designed for. Geel makes no suggestion that his mat has the properties needed for use in ceiling panels of the type described in U.S. Published Patent Application No. 20020020142. Geel alleges broad ranges ratios of glass fibers to polymer fibers to binder content, but nowhere does he teach or reasonably suggest the weight percentage ranges of glass fibers, polymer fibers and binder in applicant's claimed mats. Note that Geel's examples both use a minority of glass fibers, a majority of polymer fibers and more than 40 wt. percent of binder comprised of polyvinyl alcohol and a secondary binder. Such mats are totally different in composition and properties than the presently claimed, nor does Geel reasonably suggest the mat compositions claimed. Geel teaches a mat having two binders, each applied at a different time and between two drying steps in the manufacturing process, and the Examiner did not state which binder he believes would have been obvious to have replaced with the Arkens et al binder. Nor does Arkens et al suggest using their binder in combination with polyvinyl alcohol, or the other binders Geel et al taught as substitutes for the polyvinyl alcohol binder.

Next, even if it had been obvious to use the binder of Arkens in the process of Geel for the secondary binder in Geel, one would not have arrived at the presently claimed mats because of the different ratios of glass fibers, fiber diameters, fiber lengths, polymer fibers and binder, and more importantly one would have ended up with mats containing 15 wt. percent polyvinyl alcohol. The Examiner has not addressed this, and as shown by the evidence from an expert in the nonwoven mat technology, paragraphs #4d (i - iii), most, if not all of the mats taught by Geel would not have had the properties recited in the claimed invention and required for application in the ceiling tile mentioned specifically above. Note that the Jaffee Declaration evidences that the type of binder used and other parameters are critical to achieving a mat that has the properties recited

in the claims and that it actually took more than 54 days and more than 100 trials of different mat compositions for an expert in this art, Alan Jaffee, to discover a suitable composition for meeting the requirements of the invention. Also, Applicants have provided evidence in the Jaffee Declaration, paragraph #4 d (i, ii, iii), that the properties such as Taber Stiffness was not inherent in prior art mats, and the Examiner has not provided any evidence to support the allegation of inherency, see *In re Dembiczak*, 175 F. 3d 994, 50 USPQ 2d 1614 (Fed. Circuit 1999), for principle that the Examiner must have actual evidence from the prior art to support alleged suggestions to modify references, and *In re Soni*, 34 USPQ 2d 1634. (Fed. Circuit, 1995), *In re Jones*, 21 USPQ2d 1941 (Fed. Circuit, 1992) and *In re Gordon*, 221 USPQ 1127, 1783, for the principles that a showing of substantially improved results for the invention, and statements that the results were unexpected should suffice to establish unexpected results absent evidence to the contrary and that there must be a suggestion in the references of the desirability of combining the teachings of the references. Also see 182 USPQ 291, (CCPA, 1974) for principle that a prior art teaching of a broad range does not make obvious a narrower range if the narrow range produces much better results or properties than taught by the reference for the broad range. Finally, see *American Medical Systems, Inc. v Medical Engineering Corp.*, 26 USPQ 2d, 1081, 1091, (District Court of E.D. Wisconsin, 1992) for the principal that one may not use the applicants' disclosure as a "road map" for finding and combining prior art using only hindsight after having the benefit of applicants disclosure. Several discrepancies or deficiencies in the prior art teachings relative, such as the fact that polyvinyl alcohol is an essential ingredient in the mats of Geel and the difference in the glass fibers taught by Chenoweth, are evidence that the present rejections are improper hindsight rejections.

Also, note that Geel teaches first applying 10-20 wt. percent of polyvinyl alcohol and then later, after drying this mat, applies an additional 10-30 wt. percent of a second binder. Thus, the finished mat contains from about 20 to about 50 wt. percent of two different binders, not 10-30 percent as the Examiner urges. The Examiner has not addressed this part of Geel, nor has the Examiner made clear whether it would have been obvious to have replaced one of these binders, and which one, with the binder of Arkens or whether it would have been obvious to have replaced both binders with the binder of Arkens. Because of this continued refusal to address this issue, it is not clear what the Examiner's actual rejection is based on. Geel certainly teaches the importance of the combination of two binders in his mats and that one of the binders is polyvinyl

alcohol in an amount of 5-35 wt. percent of the fibers, see claim 1 of Geel. It would not have been obvious for one of ordinary skill to have concluded that polyvinyl alcohol was not an essential ingredient in the mats of Geel, yet the mats of applicants' claimed invention exclude any but an inconsequential amount of polyvinyl alcohol. The Examiner has not addressed this issue even though the mats of previous claim 99 was so limited. Because of this, Geel actually leads one away from the claimed invention, and prior art teachings that lead one away from the claimed invention is also evidence of non-obviousness.

Additionally, the application that the mats of the invention were designed for are for ceiling tiles of the type disclosed in US. Pat. App. No. 2002020142 as pointed out in the specification. In that patent application, the mats that were said to perform as the dividers, i.e. the mats that have to be scored and folded and then have the properties that will cause the ceiling tile to spring back into the proper thickness after having been compressed for storing and shipping and storing awaiting use, were mats disclosed in three patents owned by the assignee of the present invention, particularly US 5,840,413 and 5,942,288. The mats taught in those patents contained expensive glass microfibers, i.e. having diameters below 5 microns, and bound with a melamine formaldehyde binder. Glass microfibers cost at least double per pound compared to the 13 – 17.5 micron fibers used in the claimed mats. The mats of the present invention do not require the presence of fine glass fibers to meet the requirements for the dividers in the ceiling tile and that is a further unexpected result of the combinations claimed. The Examiner urges that since the claimed invention are mats and not ceiling tiles, that the properties required in the mats to be used in the ceiling tiles is irrelevant. This is error. Applicants have shown how difficult it was to invent mats having the properties necessary for this new type of ceiling tile and those properties were not known in prior art mats. This new type of ceiling tile could not be as cost competitive and be as commercially desirable until the mats of the claimed invention were invented. Applicants have presented evidence to support the importance of these mat properties and the Examiner has provided no evidentiary basis for urging that these properties are inherent in the mats of Geel. The claimed mats advance the art of nonwoven mats in an unobvious way and as such meet the requirements of 35 USC 103.

Failing to give weight to properties recited in article claims is reversible error, particularly when evidence to the contrary has been presented. It is improper to ignore

property limitations in the claims when the composition of the item having the properties is different than reasonably taught by the reference and especially when the applicant is claiming the properties are critical to a particular different application and/or are unexpected. It is also improper to merely presume that all mats falling within very broad ranges of components, different components at that, have properties that are not remotely suggested by the reference or any reference cited. The presumptions, to be correct, must be reasonable and must be reasonably supported by evidence. Only when the compositions are exactly the same, or very nearly the same, would one be able to reasonably assume that the properties are the same, or very nearly the same. The Examiner has not met all of the structural or chemical properties of the nonwoven mats claimed, nor is there any evidence to support the allegation that any mat in the ranges taught by Geel will inherently have the properties of the claimed mats. This argument applies to the flex properties following scoring and folding, the flammability test results, the Tabor Stiffness properties and the ratio of wet tensile to dry tensile strengths.

Finally, Chenoweth teaches compressible blankets, col. 2, lines 45-50 and col. 3, lines 61-64, of finer glass fibers (3-10 microns in diameter) and completely different types of products that the presently claimed mats, see the Jaffee Declaration, paragraph #4d (i -iii).

Chenoweth also teaches away from the claimed mats, teaching that an optimum proportion of glass fibers is 62 percent and an optimum proportion of polymer fibers is 21 percent and the optimum percent of binder is 16.5 percent. Also, the type of glass fibers taught are completely different types of fibers as described above, have fiber diameters much lower than the mats of the claimed invention, and that have various indeterminate lengths of less than 1/2 inch to approx. 3 inches. The chopped fibers in applicants' claimed mats have a narrow length distribution because of having been chopped in definite lengths from strands containing hundreds or thousands of continuous fibers whereas the rotary spun fibers of Chenoweth were shredded, see col. 3, line 68. The polymer fibers of Chenoweth also have lengths and deniers broader in range than the fibers of the claimed invention, see col. 4, lines 12-25. Chenoweth cannot reasonably suggest the compositions of the current claims, because he is dealing with different types of fibers and different types of products aimed at different applications, automotive hood liners and similar products, see col. 5, lines 25-32. By looking at any automobile hood liner one can readily see that the products are completely different than the claimed mats

and the mat of Exhibit 1. Chenoweth does not teach or reasonably suggest that his product would be suitable for use in a ceiling tile of the type described earlier, nor would one skilled in the art so conclude.

For the above reasons applicant believes that the present claims are patentable under 35 USC 103 and respectfully requests the Examiner to withdraw this rejection and to allow all of the claims.

Claims 51-64, 71-84, 91-94 and 99 stand rejected under 35 USC 103 as being unpatentable over Chenoweth et al in view of Arkens et al. The Examiner urges that Chenoweth teaches a nonwoven matrix of glass fibers and polymer fibers bound with a thermosetting binder that provides a rigid product having good strength and insulating properties. The Examiner further urges that it would have been obvious to the artisan to have substituted one of the binders taught by Arkens et al for the binder used by Chenoweth and that the mat properties recited in present claims are inherent in the blankets taught the cited references or obvious combinations of the teachings of the references. This rejection is traversed.

As mentioned above, the present claims are drawn to a nonwoven mat, not a blanket, and Chenoweth et al do not teach making a mat. Instead, Chenoweth et al teach making an insulating blanket using wool type glass fibers, rotary spun fibers, see col. 1, lines 13-18, col. 2, lines 45-48, and col. 4, line 62, and the application for the 1-3 inches thick blankets are used for automobile hood liners and similar products, see col. 5, lines 29-32. Chenoweth does not teach or reasonably suggest using chopped glass fibers having an average diameter of about 13 to about 17.5 microns, but instead teaches rotary spun glass fibers having diameters of 3-10 microns, see col. 3, lines 60-64. The fibers taught by Arkens and recited in the present claims are a completely different type of glass fibers than the rotary spun glass fibers taught by Chenoweth, see the Jaffee Declaration, paragraph #4e (i). Ceiling tiles of the type described in applicant's specification are not similar products because they contain mats and not insulating blankets 1-3 inches thick, see col. 4, lines 31-33 of Chenoweth, which blankets would be too thick and bulky to work, see the vertical mats, dividers, in the sample submitted identified as Exhibit 1. The following is taken from US Pub. Patent App. No. 20020020142:

"The dividers, on the other hand, while preferably being made of fiberglass, could be made of a carbon fiber mat, some papers, cardboards, woven materials, films, or combinations thereof, with the important feature being that they have some predetermined modulus of resiliency, similar to the specific materials identified above, which allows them to be folded but remain resilient. If the materials are to be creased to define fold lines as discussed above in connection with fiberglass material, it is important that the material retain the modulus of resiliency after having been creased, which, of course, is true with fiberglass or carbon fiber materials." and "As mentioned, numerous materials might have applicability in the present invention, but in the preferred mode, the connector sheet and the dividers are made of the same material, which is a fiberglass mat made by Johns-Manville Corporation and the mat may be one designated No. 5802 or one designated No. 5803 by Johns-Manville. The 5802 is a 120 g/m.sup.2 mat composed of 10% PET/65% 16-micron glass/25% MF. The 5803 is a 100 g/m mat composed of 12% PET/68% 16-micron glass/20% MF. MF is an abbreviation for melamine formaldehyde resin, which exhibits the characteristics of a thermoset resin. PET is an abbreviation for a polyethylene terephthalate. Dividers made from either of the 5802 or 5803 material have the ability to expand with little or no addition of heat after having been creased and folded as described previously and after having been fully compressed. A more complete description of the Johns-Manville products and related products can be found in U.S. Pat. Nos. 5,840,413, 5,942,288, and 5,972,434, which are herein incorporated by reference. "

Further, the same law cases cited in the arguments against the Geel reference and the 35USC103 rejection based on Geel pointed out above also apply to the Chenoweth reference and the rejection based on this reference.

Applicants believe that one of ordinary skill in the nonwoven fiber mat art would not look to Chenoweth et al for how to make a mat suitable for these ceiling tile and would not find any obvious direction there either. For the above reasons applicants believe that the present claims are patentable under 35 USC 103 and respectfully requests the Examiner to withdraw this rejection and to allow all of the claims.

Claims 51-64, 71-84, 91-94 and 99 were provisionally rejected under the non-statutory double patenting doctrine because of the claims in pending patent application Serial No. 10/717,802 in view of Geel. The Examiner states that the claims of the

copending application fail to include polymer fibers in the nonwoven mat, but that because of the teachings of Geel it would have been obvious to have included polymer fibers in the invention of the other pending application. This rejection is respectfully traversed. First, because the Jaffee Declaration shows that mats without the polymer fibers will not meet the requirements of the folding mats in the ceiling tile in Pub. App. 20020020142 and therefore are not merely an obvious modification – unexpected results flow from the claimed additions of polymer fibers and these results are not reasonably taught or suggested by Geel or by applicants's copending application. Second, the mats in the patent application Serial No. 10/717,802 will not meet the requirements for the vertical, folding panels in the ceiling tile of Pub. App. 20020020142, but instead are for the exposed or backer facing mat joined to the vertical, folding panels. Finally, the present claims cannot prevent the practice of the invention in Serial No. 10/717,802 – that invention does not require the use of polymer fibers in the mat as the present claims require. Also, for the same reasons given above, it would not have been obvious to one of ordinary skill in the art to have modified the invention in 10/17,802 in such a way as to arrive at the present invention. The mats of 10/17,802 were designed for the facing and backer mats of the type of ceiling tile disclosed in Pub. App. 20020020142 and do not have the properties after scoring and folding necessary for the divider mat that the mats of the present invention satisfy. For these reasons the Examiner is respectfully requested to withdraw this rejection and to allow all of the claims.

Applicants believe that the claims are now in condition for allowance, but if the Examiner believes one or more issues still exist, to expedite disposal of this application the Examiner is respectfully invited to call Applicants' attorney at the number listed below to discuss the issue or issues and a way of removing.

Respectfully submitted,


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